

Colliding-Jet Fluidic Actuators for Active Flow Control, Phase I

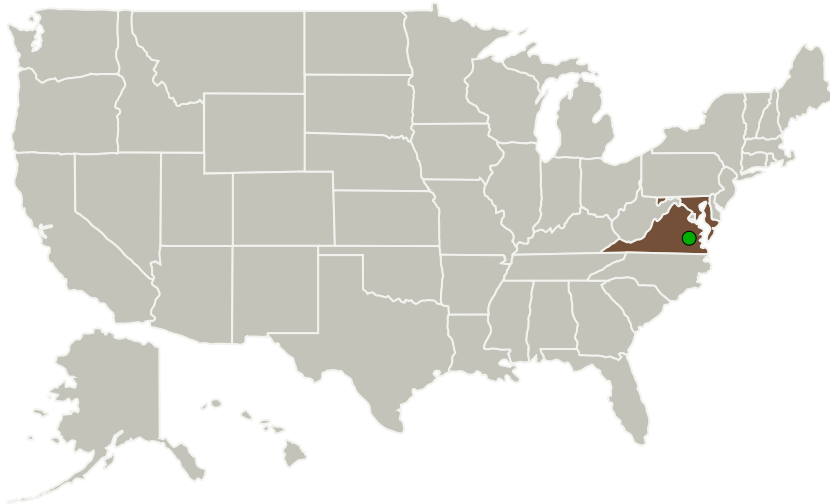
Completed Technology Project (2016 - 2016)



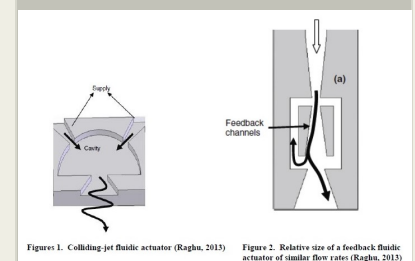
Project Introduction

We propose a novel method of producing sweeping jets using a simplified geometry that is very short in stream-wise length and no feedback channels inside. This rugged design is expected to be more efficient, occupies about 50% less space (and hence less weight) when scaled-up compared to the existing feedback-oscillator-based actuators and hence offers advantages in developing a flow control system that can be more suitable for integration into aerodynamic configurations. In Phase I, we propose to optimize the geometry for stable operation with high momentum output, and minimum streamwise length. Scaling studies will be conducted for the best design to obtain scaling laws for scale-up to full-scale. We will also develop concepts of actuator arrays with integrated plenum chamber. In Phase II, we plan to demonstrate the use of these actuators for flow control in a blended wing or on a thin airfoil flap.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Advanced Fluidics, LLC	Lead Organization	Industry Small Disadvantaged Business (SDB)	Ellicott City, Maryland
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



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Primary U.S. Work Locations

Maryland

Virginia

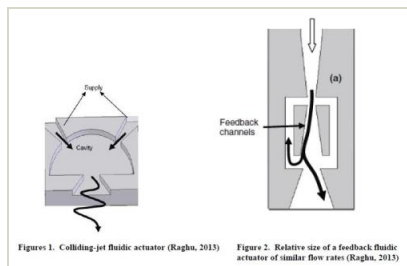
Project Transitions

**June 2016:** Project Start**December 2016:** Closed out

Closeout Documentation:

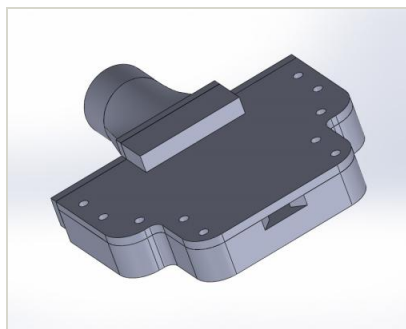
- Final Summary Chart(<https://techport.nasa.gov/file/139725>)

Images



Briefing Chart Image

Colliding-Jet Fluidic Actuators for Active Flow Control, Phase I
(<https://techport.nasa.gov/image/136150>)



Final Summary Chart Image

Colliding-Jet Fluidic Actuators for Active Flow Control, Phase I Project Image
(<https://techport.nasa.gov/image/135399>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Fluidics, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

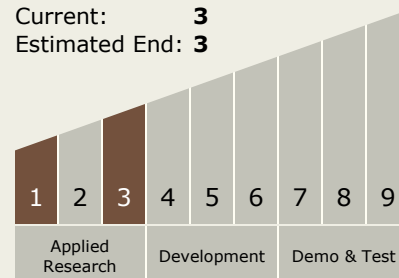
Carlos Torrez

Principal Investigator:

Surya Raghu

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.1 Aerosciences
 - └ TX15.1.5 Propulsion Flowpath and Interactions

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System